MOSS FLORA OF THE PROKLETIJE MOUNTAINS (SERBIA, MONTENEGRO)

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Abstract
The author presents the results of his own research of flora of mosses (*Musci*) of the part of Prokletije Mts. that lies in Serbia and in Montenegro. He mentions 268 species for the part, which so far remained briofloristically practically unknown; among them 10 species are new records for Serbia and 44 for Montenegro. In his horological analysis, the author specifically emphasises the large proportion of »northern elements« (arctic alpine, subarctic-subalpine, boreal-montane, boreal-temperate), which migrated into the Prokletije Mts. in the Pleistocene.
Key words: *Bryophyta* (*Musci*) flora, Prokletije Mts. (Serbia, Montenegro), horological analysis, red-listed species

Izvleček
Avtor predstavlja rezultate lastnih raziskovanj flore listnatih mahov (*Musci*) tistega dela gorskega masiva Prokletije, ki leži v državi Srbija in Črna gora. Za predel, ki je bil doslej briofloristično praktično nepoznan, navaja 268 vrst; med njimi je prvič zabeleženih 10 vrst za Srbijo in 44 za Črno goro. V horološki analizi avtor posebej poudarja velik delež »severnih elementov« (arktično-alpinski, subarktično-subalpinski, borealno-montanski, borealno-temperatni), ki so se priselili v Prokletije v pleistocenu.
Ključne besede: mahovna flora (*Musci*), Prokletije (Srbija, Črna Gora), horološka analiza, vrste na Rdečem seznamu

INTRODUCTION

The region of former Yugoslavia is briofloristically very unevenly researched. The most information that throws light on moss flora relates to the territory of Slovenia and littoral parts (comp. Pavletić 1955, Martinčič 1968, Düll & al. 1999). Among the least investigated parts are certain mountain ranges in Montenegro, Macedonia and Serbia (Kosovo). One of such regions is also the Prokletije Mts. There was only a little information on the moss flora available so far for the part that lies in the region of Serbia and Montenegro (Figure 1). This data was contributed by Baumgartner (1915), Szepesfalvy in Csiki, Javorka & Kümmerle (1926), Rudski (1936, 1949), Martinčič (1963) and Poelt (1976). The author was therefore able to collect relatively rich material in the period between 1961 – 1973, which, despite being incomplete, throws new light on the floristic and phytogeographical situation of this mountain range. Most of the moss material was collected in the higher regions, above the timberline.

THE STUDY AREA

Prokletije Mts. is a massif extending over the wider border region between Serbia, Montenegro (republics of former Yugoslavia) and Albania. It represents the southeastern end of the Dinaric mountains which closes with the river Drim in the south, i.e. in Albania. In the former Yugoslav re-

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gion it extends between Lake Skadar and Vrmoša in the west, and Beli Drim in the east. In the north, it ends with Hajla, Žljeb and Mokra planina. The valleys of rivers Pećka Bistrica, Dečanska Bistrica and some others, as well as the Plavska kotlina basin cut the »Yugoslav« part of Prokletije Mts. into several distinctive groups. The highest peak is Djeravica at 2656 m and most of the peaks are higher than 2400 m, among them Marjaš (2530 m), Žuti kamen (2522 m), Karanfil (2480 m), Starac (2426 m). Geologically speaking there is great diversity. After Marković (1958) a big part of the »Yugoslav« Prokletije Mts. consists of Permian-Carbon slates and Palaeozoic slate limestones. In places, they are covered with thick layers of Triassic limestones and dolomites. Cretaceous and Jurassic limestone and in places flysch are represented to a smaller extent. Acid eruptive rocks are very much localised. In the Pleistocene, Prokletije Mts. were exposed to a very strong influence of glaciation. The ice covered not only the peaks, but extended all the way down to the valleys, where there were also glaciers. Today, the traces of former glaciers are visible everywhere, especially in basins, glacier lakes and glacier valleys and moraines.

Collecting localities

Localities (Figure 1) are equipped with the number of the base unit of the Central-European floristic mapping system (MTB), which was used for the entire territory of former Yugoslavia. The denotation in parenthesis is from the UTM network (34T world part), and for subdivisions we applied the grid of 10×10 km. Most of the localities have the abbreviation of the state in which they are located: Serbia (**S**) or Montenegro (**M**). Four of the localities, namely the Čakor mountain pass and the peaks of Devojački krš, Starac, Pasji vrh, are on the border between the two states, and as the moss material was collected on both sides, it is impossible to determine its origin. Regretfully, ecological denotation of particular localities remains highly inadequate. Altitude most often indicates only the belt in which the moss material on a certain locality was collect-

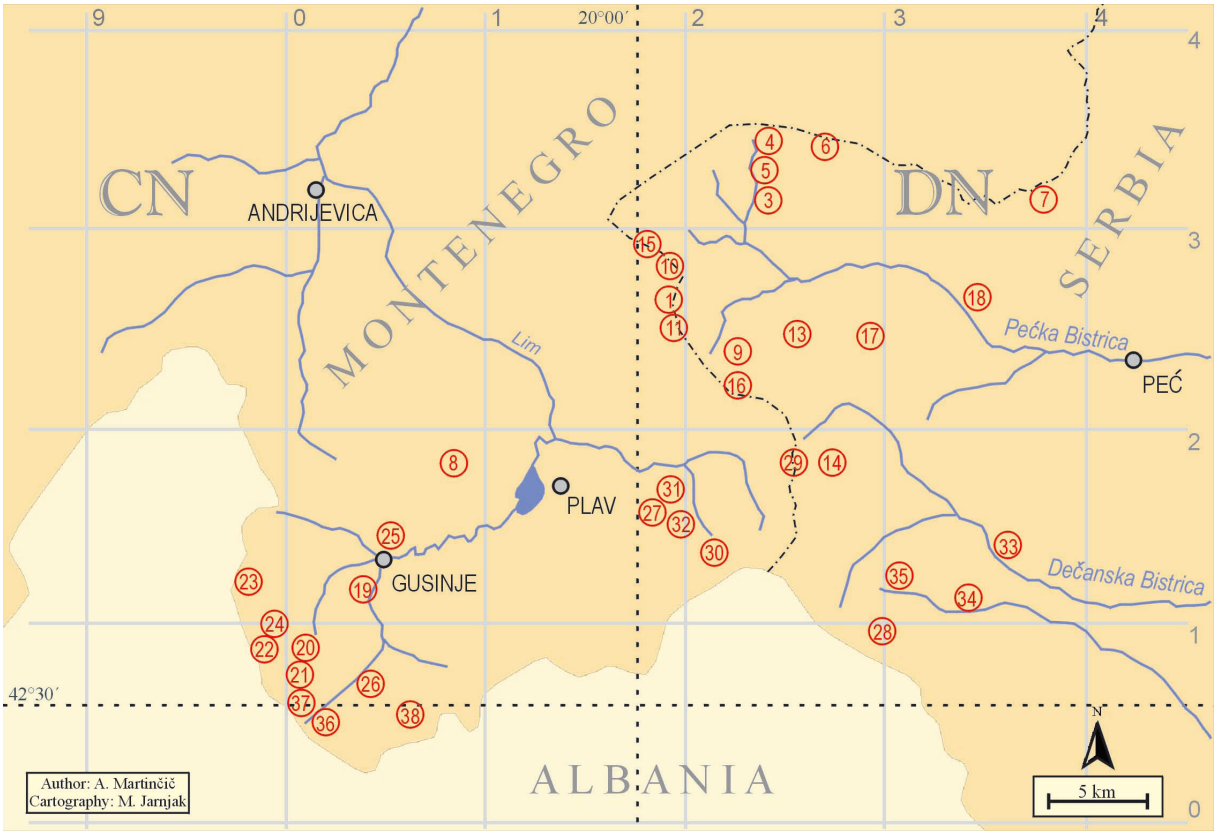

Figure 1: Map of the Prokletije Mts. (part in Serbia, Montenegro) with position of investigated Localities (numbered circles).
Slika 1: Skica srbsko-črnogorskega dela Prokletij z vrisanimi raziskanimi lokalitetami (oštevilčeni krogci).

ed. Geological – petrographic data are often very generalized – there are relatively few peaks with a homogenous petrographic composition, as it literally changes at every step on most of the peaks.

1: Mt. Vaganica, 1900 m, 2000 m; alpine grasslands and rock crevices; paleozoic slate limestones. MTB 3285 (DN12). **S**.
2: Boge – slope above valley of Bogska reka river, 1500 m, 1700 m; triassic limestone. MTB 3286 (DN23). **S**.
3: Valley of Bogska reka river, 1100–1300 m; triassic limestone. MTB 3286 (DN23). **S**.
4: Mt. Hajla: Dramodol, 2100 m; alpine grasslands and rock crevices; limestone. MTB 3286 (DN23). **S**.
5: Mt. Hajla: Škreli above Boge, 1600 m, 1800 m; limestone. MTB 3286 (DN23). **S**.
6: Mt. Hajla, 1900 m, 2270 m; alpine grasslands and rock crevices; triassic limestone. MTB 3286 (DN23). **S**.
7: Mt. Žljeb, 1700 m, 2000 m; alpine grasslands and rock crevices; triassic limestone. MTB 3287 (DN33). **S**.
8: Mt. Vizitor, 1100 m, 1500 m, 1750 m, 1900 m; forests, subalpine and alpine grasslands, springs; limestone. MTB 3385 (DN01). **M**.
9: Mt. Babina gora, 1600–1700 m; limestone. MTB 3386 (DN22). **S**.
10: Mountain pass Čakor, 1850 m; paleozoic slate limestones. MTB 3386 (DN12). **S-M**.
11: Mt. Devojački krš, 1900 m, 2000 m; alpine grasslands and rock crevices; paleozoic slate limestones. MTB 3386 (DN12). **S-M**.
12: Near the spring of Istočka reka river at the town of Peć, 600 m; limestone. MTB 3288 (DN53). **S**.
13: Mt. Malje Nedjinat, 1700–2200 m; subalpine and alpine grasslands, rock crevices; triassic limestone. MTB 3386 (DN22). **S**.
14: Mt. Marjaš, 1900–2400 m; alpine grasslands and rock crevices; paleozoic slate limestones. MTB 3386 (DN21). **S**.
15: Mt. Planinica, 1900–2000 m; alpine grasslands; limestone. MTB 3386 (DN12). **S**.
16: Mt. Starac, 1900–2400 m; alpine grasslands, rock crevices, springs; paleozoic slates. MTB 3386 (DN22). **S-M**.
17: Mt. Žuti kamen, 1800–2400 m; alpine grasslands, rock crevices; triassic limestone. MTB 3386 (DN22). **S**.
18: Gorge Rugovska klisura, 500 m; rocks; limestone. MTB 3387 (DN32). **S**.
19: Springs Alipašini izvori near Gusinje, 1000 m; springs, rock crevices; triassic limestone. MTB 3484 (DN01). **M**.
20: Valley Grbaja, 1000 m, 1200 m; triassic limestone. MTB 3484 (DN00). **M**.
21: Mt. Karanfil-slopes, 1450–1600 m; forests; triassic limestone. MTB 3484 (DN00). **M**.
22: Mt. Popadija, 1700–2000 m; alpine grasslands, rock crevices; triassic limestone and cretaceous flysch. MTB 3484 (CN90). **M**.
23: Mt. Trojan, 1900–2180 m; alpine grasslands, rock crevices; triassic limestone. MTB 3484 (CN91). **M**.
24: Mt. Volušnica, 1600 m; subalpine grasslands; flysch. MTB 3484 (CN90). **M**.
25: Near Gusinje, 1000 m; limestone. MTB 3485 (DN01). **M**.
26: Savina voda in valley Ropojana, 1200 m; springs; triassic limestone. MTB 3485 (DN00). **M**.
27: Vragonos above river Treskavička reka , 1500 m; stand of *Pinus leucodermis*; flint conglomerate. MTB 3485 (DN11). **M**.
28: Mt. Djeravica, 2200–2600 m; alpine grasslands, rock crevices; eruptive-gabro. MTB 3486 (DN20-21). **S**.
29: Mt. Pasji vrh, 1900–2400 m; alpine grasslands; limestone. MTB 3486 (DN21). **S-M**.
30: Around lake Ridsko jezero, 2000 m; rocks, rock crevices; flint conglomerate. MTB 3486 (DN21). **M**.
31: Valley of river Treskavička reka, 1400–1500 m; flint conglomerate. MTB 3486 (DN11). **M**.
32: Mt. Treskavica under Veliki Rid, 1600–1900 m; flint conglomerate. MTB 3486 (DN11). **M**.
33: Valley of river Dečanska Bistrica, 900–1200 m; paleozoic slate. MTB 3487 (DN31). **S**.
34: Valley of river Ločanska Bistrica, 1300 m; paleozoic slate. MTB 3487 (DN30). **S**.
35: Mt. Maja Kurvala, 1700–1900 m; paleozoic limestone. MTB 3487 (DN31). **S**.
36: Valley Ropojana, 1200 m; triassic limestone. MTB 3584 (DN00). **M**.
37: Mt. Karanfil-peak, 2000–2400 m; alpine grasslands, rock crevices; triassic limestone. MTB 3584 (DN00).**M**.
38: Mt. Belić, 1600–2300 m; forests, subalpine and alpine grasslands, rock crevices; triassic limestone. MTB 3585 (DN00). **M**.

For the sake of completeness we included data from the literature as well (Baumgartner 1915, Szepesfalvy 1926, Rudski 1936, 1949, Poelt 1976). The source Breidler (1888) was not considered,

because it is not clear if the localities in this work e. g. Vila, Kokura, Širokar, Mojan, lake Rikavac belong to the Prokletije Mts.

Nomenclature and taxonomy follows the work MARTINČIČ (2003): Annotated check-list of mosses of Slovenia, which is mostly based on the work of DIERSSEN (2001). The map of study area (Figure 1) is equipped with the grid of 10×10 km from UTM network. Names of localities are from map "Prokletije, mountain map" (1966). The specimens are preserved in the Herbarium of Department of Biology (Biotechnical faculty) University of Ljubljana (LJU).

RESULTS AND DISCUSSION

Floristical results

Based on the data acquired so far, the flora of mosses (*Musci*) of the »Yugoslav« part of Prokletije Mts. comprises 268 species. This represents 42 % of moss species recorded till now in Serbia-Montenegro. The folowing 16 species are new to Serbia-Montenegro: *Brachythecium erythrorhizon, B. glaciale, B. oedipodium, B. trachypodium, Bryum blindii, B. muehlenbeckii, B. sauteri, Didymodon icmadophylus, Grimmia affinis, G. decipiens, Lescuraea saxicola, Orthotrichum alpestre, Platydictya jungermannioides, Racomitrium aciculare, Rhynchostegiella tenuicaulis* and *Scorpidium cossonii*. In Serbia are for the first time reported: *Brachythecium glaciale, B. oedipodium, Bryum blindii, B. sauteri, Didymodon icmadophilus, Grimmia affinis, Racomitrium aciculare, Rhynchostegiella tenuicaulis, Timmia bavarica, T. norvegica* and 44 species are new to Montenegro (marked with * in List of taxa). The number of recorded moss species for Prokletije Mts. is not definite and with further research, especially of the lower part for which we have very little data, the species number will be increased.

List of taxa:

Amblystegium confervoides (Brid.) B., S. & G.: *bor-temp* – Planinica, 1500 m.

Amblystegium serpens (Hedw.) B., S. & G.: *ubikv* – valley of river Bogska reka, 1300 m; Belić, 1700 m.

****Amblystwgium subtile*** (Hedw.) B., S. & G.: *temp-subkont* – valley Grbaja, 1200 m; valley Ropojana: near Savina voda, 1200 m; Vragonos above river Treskavička reka, 1500 m; valley of river Treskavička reka, 1400 m; Volušnica, 1600 m.

Amphidium mougeotii (B. & S.) Schimp.: *bor-mont* – Djeravica, 2500 m; SW above Dečani, 1600 m (BAUMGARTNER 1915).

Andreaea rothii Web. & Mohr subsp. ***rothii***: *bor-temp* - Djeravica, 2500 m.

Andreaea rupestris Hedw. var. ***rupestris***: *bor-mont* – Djeravica, 2500 m; Starac, 2100 m.

Anomodon attenuatus (Hedw.) Hüben.: *subtemp* – Vizitor, 1700 m; valley Grbaja, 1200 m; Vragonos above river Treskavička reka, 1500 m; valley Ropojana, 1200 m.

Anomodon viticulosus (Hedw.) Hook. & Tayl.: *bor-temp* – at spring of river Istočka reka near Peć, 600 m; valley of river Bogska reka near Kučište, 1100 m; springs Alipašini izvori near Gusinje, 1000 m; valley Grbaja, 1200 m; valley Ropojana, 1200 m; Belić, 1650 m.

Antitrichia curtipendula (Hedw.) Brid.: *bor-temp* – Starac, 1800 m; valley Ropojana, 1200 m.

Atrichum undulatum (Hedw.) P. Beauv.: *bor-temp.* – Vizitor, 1500 m; Hajla: Dramodol, 2100 m; Babina gora, 1600 m; Malje Nedjinat, 1900 m; Vragonos above river Treskaviička reka, 1500 m; Dečani near Peć (SZEPESFALVY 1926 – 3387, DN42).

Aulacomnium palustre (Hedw.) Schwaegr.: *subbor* – Starac, 2100 m; Djeravica, 1900 m.

Barbula convoluta Hedw.: *ubikv* – Žljeb, 2000 m.

Barbula unguiculata Hedw.: *ubikv* – Trojan, 1900 m; Belič, 2300 m; pass Čakor (SZEPESFALVY 1926); near Peć (SZEPESFALVY 1926 – 3387, DN42).

Bartramia halleriana Hedw.: *bor-mont* – Babina gora, 1600 m; valley of river Treskavička reka, 1400 m; valley Ropojana, 1200 m.

Bartramia ithyphylla Brid.: *bor-mont* – Vizitor, 1900 m; Žljeb, 2000 m; Devojački krš, 1900 m; Starac, 2300 m; Planinica, 1900 m; Babina gora, 1600 m; Malje Nedjinat, 1900 m; Djeravica, 2500 m; Treskavica under Veliki Rid, 1800 m; Belić, 1900 m; Žljeb, 1700 m.

var. ***strigosa*** (Wahlenb.) C. Hartm. – Pasji vrh, 2100 m.

var. ***breviseta*** (Lindb.) Kindb. – Maja Kurvala, 1900 m.

Bartramia pomiformis Hedw.: *bor-temp* – Starac, 2100 m; Vragonos above river Treskavička reka, 1300 m.

Blindia acuta (Hedw.) B., S. & G.: *bor-mont* – Starac, 2100 m.

****Brachythecium albicans*** (Hedw.) B., S. & G.: *bor-temp* – Vizitor, 1900 m.

****Brachythecium erythrorhizon*** B., S. & G.: *subarkt-subalp* – at lake Ridsko jezero, 2000 m.

Brachythecium geheebii Milde: *temp-subkont* – valley Grbaja, 1200 m; Belić, 1700 m; Karanfil, 1500 m.

****Brachythecium glaciale*** B., S. & G.: *subarkt-subalp* – Planinica, 2000 m; Žljeb, 1500 m; Trojan, 1900 m;

Brachythecium glareosum (Spruce) B., S. & G.: *bor-temp* – Žljeb, 2000 m; Vizitor, 1500 m; gorge Rugovska klisura near Peć, 500 m; valley of river Treskavička reka, 1500 m; Karanfil 1450 m; Belić, 2300 m; Djeravica; valley Grbaja, 1200 m; Hajla: Dramodol, 2100 m.

****Brachythecium mildeanum*** (Schimp.) Schimp. ex Milde: *temp* – Vizitor, 1900 m; valley Grbaja, 1200 m; Vragonos above river Treskavička reka, 1500 m; Pasji vrh, 2100 m; at lake Ridsko jezero, 2000 m; Belić, 1650 m.

Brachythecium oedipodium (Mitt.) Jaeg.: *temp* – Planinica, 2000 m; Pasji vrh, 2100 m.

Brachythecium plumosum (Hedw.) B., S. & G.: *bor-temp* – Treskavica under V. Rid, 1700 m.

Brachythecium populeum (Hedw.) B., S. & G.: *temp* – Planinica, 2000 m; valley of river Treskavička reka, 1400 m.

Brachythecium reflexum (Starke) B., S. & G.: *bor-mont* – Boge, 1600 m; Hajla: kota 2278; Karanfil, 2050 m.

Brachythecium rivulare B., S. & G.: *bor-temp* – Vizitor, 1700 m; Starac, 2100 m; gorge Rugovska klisura near Peć, 500 m; springs Alipašini izvori near Gusinje, 1000 m; valley Grbaja, 1200 m; Maja Kurvala, 1800 m; valley Ropojana: at Savina voda, 1200 m; Babina gora, 1600 m; Vizitor, 1900 m.

Brachythecium rutabulum (Hedw.) B., S. & G.: *temp* – valley of river Bogska reka, 1100 m; valley Grbaja, 1200 m; Belić, 1650 m.

Brachythecium salebrosum (Web. & Mohr) B., S. & G.: *subbor* – Boge 1700 m; Žljeb, 1500 m; Vizitor, 1000 m, 1500 m; Planinica, 1900 m; Popadija, 1900 m; Djeravica, 1900 m; Karanfil, 2000 m; Belić, 1900 m; Žljeb, 1500 m; pass Čakor, 1500 m (Szepesfalvy 1926).

Brachythecium starkei (Brid.) B., S. & G.: *bor-mont* – Vizitor, 1750 m; Starac, 2100 m; Belić, 2300 m.

Brachythecium trachypodium (Brid.) B., S. & G.: *subarkt-subalp* – Starac, 2300 m.

Brachythecium velutinum (Hedw.) B., S. & G.: *temp* – valley of river Bogska reka, 1200 m; Vizitor, 1700 m; Planinica, 1900 m; valley Grbaja, 1200 m; Treskavica under V. Rid, 1800 m; valley of river Ločanska Bistrica, 1300 m; valley Ropojana, 1200 m; Belić, 1400 m, 1900 m; Volušnica, 1600 m; Babina gora, 1600 m.

Bryoerythrophyllum recurvirostrum (Hedw.) Chen: *bor-temp* – valley of river Bogska reka, 1100 m; Hajla: Dramodol, 2100 m; Žljeb, 1500 m, 2000 m; Planinica, 2000 m; Malje Nedjinat, 1900 m; gorge Rugovska klisura near Peć, 500 m; springs Alipašini izvori near Gusinje, 1000 m; valley of river Treskavička reka, 1400 m; Karanfil, 2000 m.

Bryum alpinum With.: *temp* – Vizitor, 1900 m; Starac, 2300 m; Malje Nedjinat, 1900 m.

Bryum argenteum Hedw.: *ubikv.* – pass Čakor, 1500 m (Szepesfalvy 1926)

****Bryum blindii*** B., S. & G.: *temp* – Babina gora, 1600 m; Starac, 2100 m; valley Grbaja, 1200 m.

Bryum caespiticium Hedw.: *ubikv* – valley of river Bogska reka, 1100 m; Devojački krš, 1800 m; Žuti kamen, 1700 m; Popadija, 1800 m; Pasji vrh, 2100 m.

Bryum capillare Hedw.: *ubikv* – Vizitor, 1800 m; Babina gora, 1600 m; Devojački krš, 1800 m; valley Ropojana, 1200 m; Karanfil, 2000 m.

Bryum creberrimum Tayl.: *bor-temp* – Hajla: Škreli above Boge, 1800 m; valley of river Bogska reka, 1100 m; Babina gora, 1600 m; Devojački krš, 1800 m; Malje Nedjinat, 1900 m; valley Grbaja, 1200 m; valley of river Treskavička reka, 1400 m; at lake Ridsko jezero, 2000 m.

Bryum funckii Schwaegr.: *temp* – Devojački krš, 1800 m.

****Bryum imbricatum*** (Schwaegr.) B. & S.: *temp* – Hajla: kota 2278; Planinica, 2000 m; Starac, 1900 m; Devojački krš, 1800 m; Belić, 2300 m.

Bryum intermedium (Brid.) Bland.: *subbor* – Hajla: Dramodol, 2100 m.

****Bryum muehlenbeckii*** B., S. & G.: *bor-mont* – Vizitor, 1900 m; Belić, 2200 m.

Bryum pallescens Schleich. ex Schwaegr.: *ubikv* – Babina gora, 1600 m; Devojački krš, 1800 m; valley Grbaja, 1200 m; Popadija, 1800 m; along river Ločanska Bistrica, 1300 m.

Bryum pseudotriquetrum (Hedw.) Gaertn., Meyer & Scherb. var. ***pseudotriquetrum***: *ubikv* – Vaganica, 2000 m; Vizitor, 1900 m; Babina gora, 1600 m; Devojački krš, 1800 m; Starac, 2100 m; Popadija, 1700 m; springs Alipašini izvori near Gusinje, 1000 m; valley of river Treskavička reka, 1400 m; Treskavica, under Veliki Rid, 1600 m; Djeravica, 2100 m; Maja Kurvala, 1800 m; Pasji vrh, 2300 m; Belić, 1900 m.

*var. ***bimum*** (Brid.) Hartm.: *temp* – Malje Nedjinat, 1800 m; Starac, 2100 m; springs Alipašini izvori near Gusinje, 1000 m; valley of river Treskavička reka, 1400 m.

****Bryum sauteri*** B., S. & G.: *temp* – Djeravica, 2300 m; valley of river Treskavička reka, 1400 m.

Bryum schleicheri Lam. & DC.: *bor-mont* – Vizitor, 1900 m; Starac, 2100 m; Vragonos above river Treskavička reka, 1500 m; Djeravica, 2200 m; Treskavica under Veliki Rid, 1800 m.

var. ***latifolium*** (Schwaegr.) Schimp.: *bor-mont* – Babina gora, 1600 m; Devojački krš, 1800 m; Starac, 2100 m; springs Alipašini izvori near Gusinje, 1000 m; Djeravica, 2000 m; Maja Kurvala, 1800 m.

Bryum turbinatum (Hedw.) Turn.: *ubikv* – Pasji vrh, 2200 m.

Bryum weigelii Spreng.: *bor-mont* – Starac, 2200 m.

Buxbaumia viridis (Moug. ex Lam.& DC.) Brid. ex Moug. & Nestl.: *bor-mont* – at river Ločanska Bistrica, 1300 m.

****Calliergon stramineum*** (Brid.) Kindb.: *bor-mont* – Vizitor, 1750 m; Starac, 2100 m; at lake Ridsko jezero, 2000 m.

var. ***patens*** (Lindb.) Broth. – Vizitor, 1750 m.

Calliergonella cuspidata (Hedw.) Loeske: *temp* – Hajla: Dramodol, 2100 m; Vizitor, 1500 m; Malje Nedjinat, 1700 m; gorge Rugovska klisura near Peć, 500 m; Treskavica under Veliki Rid, 1600 m; springs Alipašini izvori near Gusinje, 1000 m; at lake Ridsko jezero, 2000 m; Starac, 2100 m.

Campyliadelphus chrysophyllus (Brid.) Kanda: *ubikv* – Popadija, 1900 m.

****Campyliadelphus elodes*** (Lindb.) Kanda: *temp* – Vizitor, 1600 m; gorge Rugovska klisura near Peć, 500 m.

Campylium stellatum (Hedw.) Lange & C. Jens.: *bor-temp* – Hajla, 2000 m; Vizitor, 1900 m; Malje Nedjinat, 1700 m; Popadija, 1800 m; Pasji vrh, 2100 m; Karanfil, 2000 m; Belić, 2000 m.

var. ***protensum*** (Brid.) Bryhn ex Grout: *bor-temp* – Starac, 2100 m.

Campylophyllum calcareum (Crundw. & Nyholm) Hedenäs: *temp* – valley of river Dečanska Bistrica, 1100 m.

****Campylophyllum halleri*** (Hedw.) Fleisch.: *bor-mont* – Boge: at alpine house, 1700 m; Devojački krš, 1900 m; Belić, 1650 m.

Ceratodon purpureus (Hedw.) Brid.: *ubikv* – valley of river Bogska reka, 1300 m; Hajla: Dramodol, 2100 m; Babina gora, 1600 m; Devojački krš, 1900 m; Malje Nedjinat, 1800 m; Starac, 2100 m; valley Grbaja, 1000 m; Trojan, 2000 m; Vragonos above river Treskavička reka, 1500 m; at river Ločanska Bistrica, 1300 m; Maja Kurvala, 1800 m; Žljeb, 1700 m.

Cinclidotus aquaticus (Hedw.) B. & S.: *temp* – gorge Rugovska klisura near Peć, 500 m.

Cinclidotus fontinaloides (Hedw.) P. Beauv.: *merid-temp* – valley Grbaja, 1200 m; valley Ropojana: near Savina voda, 1200 m.

Cirriphyllum piliferum (Hedw.) Grout: *bor-temp* – Planinica, 2000 m; valley Grbaja, 1200 m; valley Ropojana: at Savina voda, 1200 m; Karanfil, 1450 m.

Cirriphyllum tommasinii (Sendtn. ex Boul.) Grout: *temp-subkont* – valley of river Bogska reka, 1300 m; Vizitor, 1900 m; Popadija, 1800 m; valley of river Treskavička reka, 1400 m; Karanfil, 2000 m; Belić, 1650 m, 1900 m; valley Grbaja, 1200 m.

Climacium dendroides (Hedw.) Web. & Mohr: *subbor* – springs Alipašini izvori near Gusinje, 1000 m.

Cratoneuron filicinum (Hedw.) Spruce: *ubikv*

var. ***filicinum*** – valley of Bogska reka, 1300 m; Vizitor, 1900 m; Devojački krš, 1900 m; springs Alipašini izvori near Gusinje, 1000 m; gorge Rugovska klisura near Peć, 500 m; Volušnica, 1600 m; Trojan, 1900 m; valley of river Dečanska Bistrica, 1100 m; Karanfil, 1600 m; Belić, 2000 m; Peklen (SZEPESFALVY 1926 – 3387, DN42).

var. ***atrovirens*** (Brid.) Ochyra – Vizitor, 1000–1500 m; valley of river Ločanska Bistrica, 1300 m; valley Ropojana: at Savina voda, 1200 m.

Ctenidium molluscum (Hedw.) Mitt.: *bor-temp* – valley of river Bogska reka, 1300 m; Hajla: kota 2278; Vizitor, 1900 m; Planinica, 2000 m; gorge Rugovska klisura near Peć, 500 m; springs Alipašini izvori near Gusinje, 1000 m; valley Grbaja, 1200 m; Popadija, 1800 m; Pasji vrh, 1800 m; valley of river Ločanska Bistrica, 1300 m; valley Ropojana, 1200 m; Karanfil, 1450 m; Belić, 2300 m; Žljeb, 1700 m.

Cynodontium polycarpon (Hedw.) Schimp.: *bor-mont* – Starac, 2100 m.

Desmatodon heimii (Hedw.) Mitt.: *bor-temp* – Dečani near Peć (SZEPESFALVY 1926 – 3487, DN41)

Desmatodon latifolius (Hedw.) Brid.: *subarkt-subalp* – Boge, 1700 m; Hajla: kota 2279, 1900 m; Devojački krš, 1900 m; Starac, 2100 m; Žuti Kamen, 2400 m; Marjaš, 2300 m; Malje Nedjinat, 2200 m; Djeravica, 2500 m.

Dichodontium pellucidum (Hedw.) Schimp. *bor-mont* – Hajla: kota 2278; Žljeb, 2000 m; Babina gora, 1700 m; valley of Treskavička reka, 1500 m; at lake Ridsko jezero, 2000 m; Karanfil, 2000 m; Belić, 2300 m.

****Dicranella grevilleana*** (Brid.) Schimp.: *bor-mont* – Trojan, 2000 m; at lake Ridsko jezero, 2000 m.

****Dicranella humilis*** Ruthe: *bor-mont* – Devojački krš, 2000 m.

Dicranoweisia crispula (Hedw.) Milde: *bor-mont* – Babina gora, 1700 m; Starac, 2400 m; Pasji vrh, 2200 m; Djeravica, 2500 m; Maja Kurvala, 1700 m; Popadija, 1800 m; SE from Plav along road to Dečani, 1800 m (Baumgartner 1915).

Dicranum fuscescens Sm.: *bor-mont* – Starac, 2200 m; Pasji vrh, 2300 m; Djeravica, 2300 m; at lake Ridsko jezero, 2000 m.

Dicranum muehlenbeckii B., S. & G.: *bor-mont* – Pasji vrh, 2300 m.

Dicranum polysetum Sw.: *bor-mont* – Babina gora, 1600 m; Devojački krš, 2000 m; Malje Nedjinat: kota 2341; Planinica, 1900 m; Starac 2100 m; Pasji vrh, 2300 m; valley of river Ločanska Bistrica, 1300 m; Maja Kurvala, 1700 m.

Dicranum scoparium Hedw.: *subbor* – Hajla: Škreli above Boge, 1800 m; valley of river Bogska reka, 1300 m; Vizitor, 1900 m; Starac, 2100 m; valley Grbaja, 1200 m; Karanfil, 1400 m; Trojan, 1900 m; valley Ropojana, 1200 m; Vragonos above river Treskavička reka, 1500 m; Pasji vrh, 2300 m; at lake Ridsko jezero, 2000 m; Belić, 2200 m; pass Čakor (Szepesfalvy 1926); near Peć (Szepesfalvy 1926 – 3387, DN42); Dečani near Peć (Szepesfalvy 1926 – 3487, DN41); Maja Rusolija, 1900–2200 m (Rudski 1949 – 3287, DN43).

Dicranum tauricum Sap.: *temp* - Vizitor, 1900 m; Babina gora, 1600 m; Planinica, 1900 m; Starac 2100 m; Malje Nedjinat, 1700 m; Treskavica above Veliki Rid, 1600 m; at lake Ridsko jezero, 2000 m; along river Ločanska Bistrica, 1300 m; Maja Kurvala, 1700 m.

Didymodon acutus (Brid.) K. Saito: *merid-temp* – Vizitor, 1900 m; along river Dečanska Bistrica, 1200 m; Belić, 2300 m.

Didymodon fallax (Hedw.) Zander: *ubikv* – valley of river Bogska reka, 1300 m; Hajla: Dramodol, 2100 m; Devojački krš, 1900 m; gorge Rugovska klisura near Peć, 500 m; Belić, 2000 m.

Didymodon icmadophilus (Schimp.) K. Saito: *subarkt-subalp* – Hajla: Dramodol, 2100 m.

Distichium capillaceum (Hedw.) B., S. & G.: *bor-mont* – Boge, 1700 m; Hajla: kota 1933; Planinica, 2000 m; Devojački krš, 2000 m; Starac, 2300 m; Malje Nedjinat, 1900 m; gorge Rugovska klisura near Peć, 500 m; Popadija, 1800 m; Karanfil, 1450 m, 2000 m; valley Ropojana, 1200 m; Stubica, 1400 m (Rudski 1949 – 3287, DN43); Maja Rusolija, 1900–2200 m (Rudski 1949 – 3287, DN43).

Distichium inclinatum (Hedw.) B., S. & G.: *subarkt-subalp* – Belić, 2300 m.

****Ditrichum crispatissimum*** (C. Müll.) Par.: *bor-temp* – valley of river Bogska reka, 1200 m; gorge Rugovska klisura near Peć, 500 m; Belić, 1650 m; valley Ropojana: near Savina voda, 1200 m; Popadija, 1800 m; Djeravica.

Ditrichum flexicaule (Hedw.) Hampe: *bor-temp* – Boge, 1700 m; Hajla: kota 2278; Žljeb, 2000 m; Vizitor, 1700 m; Devojački krš, 1900 m; Starac, 2100 m; Malje Nedjinat, 1900 m; Žuti kamen, 1800 m; gorge Rugovska klisura near Peć, 500 m; springs Alipašini izvori near Gusinje, 1000 m; valley Grbaja, 1200 m; Popadija, 1800 m; Trojan, 1900 m; Djeravica, 2400 m; valley Ropojana: near Savina voda, 1200 m; Karanfil, 1450 m, 1600 m; Belić, 1650 m, 2000 m; Koprivnik, 2000 m (Szepesfalvy 1926 – 3387, DN32).

****Dryptodon patens*** (Hedw.) Brid.: *bor-mont* – Treskavica under Veliki Rid, 1700 m; at lake Ridsko jezero, 2000 m.

Encalypta affinis Hedw. f.: *arkt-alp* – Žljeb, 2000 m; Devojački krš, 2000 m; Žuti Kamen, 1900 m; Starac, 2100 m; Pasji vrh, 2100 m.

Encalypta alpina Sm.: *arkt-alp* – Hajla: kota 2278; Planinica, 1900 m; Popadija, 1800 m; Belić, 2300 m.

Encalypta ciliata Hedw.: *bor-mont* – Babina gora, 1700 m; Marjaš, 1900 m; Vragonos above river Treskavička reka, 1500 m; valley Ropojana, 1200 m; Koprivnik above Peć, 2000 m (Szepesfalvy 1926 – 3387, DN32).

Encalypta rhaptocarpa Schwaegr.: *subarkt-subalp* – Devojački krš, 2000 m; Marjaš, 2300 m; Malje Nedjinat, 1900 m.

Encalypta streptocarpa Hedw.: *bor-temp* – valley of river Bogska reka, 1300 m; Hajla: Dramodol, 2100 m; Žljeb, 2000 m; Vizitor, 1500 m; Malje Nedjinat, 2100 m; Devojački krš, 2000 m; Marjaš, 2000 m; Starac, 2100 m; Planinica, 1900 m; springs Alipašini izvori near Gusinje, 1000 m; Karanfil, 1600 m; Popadija, 1900 m; Pasji vrh 2200 m; valley Ropojana, 1200 m; Belić, 1650 m, 1900 m; Stubica, 1400 m (Rudski 1949 – 3287, DN43).

Encalypta vulgaris Hedw.: *merid-temp* – Hajla: kota 2278; valley of river Bogska reka near Kučište, 1100 m; Devojački krš, 1900 m; Starac, 2200 m; Malje Nedjinat, 1900 m; Karanfil, 2050 m; Belić, 1900 m; Djeravica.

Entodon concinnus (De Not.) Par.: *bor-mont* – valley Ropojana, 1200 m.

Entosthodon fascicularis (Hedw.) C. Müll.: *temp* – Žljeb, 1700 m.

Eucladium verticillatum (Brid.) B., S. & G.: *merid-temp* – at spring of river Istočka reka near Peć, 500 m; gorge Rugovska klisura near Peć, 500 m; near Gusinje, 1000 m; Belić, 1700 m; Peklen (SZEPESFALVY 1926 – 3387, DN42)

****Eurhynchium angustirete*** (Broth.) T. Kop.: *temp-subkont* – Hajla: Škreli above Boge, 1800 m; valley of river Bogska reka, 1300 m; Babina gora, 1600 m; Vragonos above river Treskavička reka, 1500 m; Treskavica under V. Rid, 1600 m; Karanfil, 1600 m.

Eurhynchium crassinervium (Wils.) Schimp.: *temp* – Planinica, 1900 m; Belić, 2300 m.

Eurhynchium pulchellum (Hedw.) Jenn. var. ***pulchellum***: *subbor* – valley of river Bogska reka, 1300 m; Vragonos above river Treskavička reka, 1500 m; Žljeb, 1200 m.

*var. ***diversifolium*** (B., S. & G.) C. Jens.: *subarkt-subalp* – Boge, 1700 m; Vizitor, 1700 m; Devojački krš, 1900 m; Planinica, 1900 m; Starac, 2100 m; valley Grbaja, 1200 m; Trojan, 1900 m; valley Ropojana, 1200 m; Belić, 1900 m; Žljeb, 1700 m.

Eurhynchium schleicheri (Hedw. f.) Jur.: *merid-temp* – valley Grbaja, 1200 m; Vragonos above river Treskavička reka, 1500 m; valley Ropojana, 1200 m; Karanfil, 1450 m; Belić, 2000 m.

Eurhynchium speciosum (Brid.) Jur.: *temp* – gorge Rugovska klisura near Peć, 500 m; valley of river Treskavička reka, 1400 m.

Fissidens adianthoides Hedw.: *bor-temp* – near Peć (SZEPESFALVY 1926 – 3387, DN42)

Fissidens dubius P. Beauv.: *temp* – Hajla, 2270 m; Planinica, 2000 m; Popadija, 1900 m; Volušnica, 1600 m; gorge Rugovska klisura near Peć, 500 m; Pasji vrh, 1900 m; Karanfil, 2000 m, 1450 m; valley Ropojana, 1200 m; Belić, 1700 m, 1900 m, 2300 m.

Fissidens taxifolius Hedw. ssp. ***taxifolius***: *merid-temp* – Vizitor, 1700 m; Karanfil, 2000 m; at spring of Istočka reka near Peć, 600 m.

Fontinalis antipyretica Hedw.: *bor-temp* – Starac, 1800 m.

Funaria hygrometrica Hedw.: *ubikv* – at spring of river Istočka reka near Peć, 600 m; gorge Rugovska klisura near Peć, 500 m; springs Alipašini izvori near Gusinje, 1000 m; Vragonos above valley of river Treskavička reka, 1500 m; Žljeb, 1700 m; pass Čakor, 1500 m (SZEPESFALVY 1926).

Funaria muehlenbergii Turn.: *merid-temp* – at spring of river Istočka reka near Peć, 600 m; Hajla: kota 2278; Belić, 1800 m.

Grimmia affinis Hornsch.: *bor-temp* – Djeravica, 2300 m.

Grimmia alpestris (Web. & Mohr) Schleich. ex Hornsch.: *bor-mont* – Starac 2100 m; Pasji vrh 1900 m; Treskavica under Veliki Rid 1600 m; Maja Kurvala 1800 m.

Grimmia anodon B. & S.: *bor-temp* – valley Ropojana: near Savina voda, 1200 m; Belić, 2000 m.

Grimmia caespiticia (Brid.) Jur.: *subarkt-subalp* – Pasji vrh, 1700 m; Djeravica, 2300 m.

****Grimmia decipiens*** (K.F. Schultz)Lindb.: *temp* – Treskavica under Veliki Rid, 1700 m.

Grimmia elongata Kaulf.: *subarkt-subalp* – Starac, 2400 m (Poelt 1976).

Grimmia funalis (Schwaegr.) B. & S.: *bor-mont* – Starac, 2300 m.

Grimmia hartmanii Schimp. var. ***hartmanii***: *subbor* – Babina gora; Maja Kurvala 1800 m; SE from Plav along road to Dečani, 1600 m (BAUMGARTNER 1915).

****Grimmia montana*** B. & S.: *temp* – Starac, 2200 m; Maja Kurvala, 1800 m; Pasji vrh, 1700 m.

Grimmia ovalis (Hedw.) Lindb.: *subbor* – valley of river Bogska reka 1300 m; Djeravica.

Grimmia pulvinata (Hedw.) Sm. var. ***pulvinata***: *merid-temp* – at spring of river Istočka reka near Peć, 600 m; Vizitor, 1500 m; springs Alipašini izvori near Gusinje, 1000 m; Dečani near Peć (SZEPESFALVY 1926 – 3487, DN41).

Gymnostomum aeruginosum Sm.: *subbor* – Starac, 1900 m; Vizitor, 1900 m.

Gymnostomum calcareum Nees & Hornsch.: *merid-temp* – gorge Rugovska klisura near Peć, 500 m.

Herzogiella seligeri (Brid.) Iwats.: *subtemp* – valley of river Bogska reka, 1300 m; Babina gora, 1600 m; Treskavica under V. Rid; valley of river Ločanska Bistrica, 1300 m.

Heterocladium dimorphum (Brid.) B., S. & G.: *bor-mont* – Vizitor, 1900 m; Planinica, 2000 m; Starac, 2100 m; Malje Nedjinat, 1800 m; Volušnica, 1600 m; Popadija, 1800 m; Pasji vrh, 1900 m.

****Homalia besseri*** Lob.: *temp-subkont* – at spring of river Istočka reka near Peć, 600 m; valley Ropojana, 1200 m.

Homalothecium lutescens (Hedw.) Robins.: *merid-temp* – valley Grbaja, 1200 m.

Homalothecium philippeanum (Spruce) B., S. & G.: *temp-subkont* – valley of river Bogska reka at Kučište, 1100 m; Hajla: Dramodol, 2100 m; Vizitor, 1700 m; Devojački krš, 1900 m; Malje Nedjinat, 1700 m; valley Grbaja, 1200 m; Volušnica, 1600 m; Djeravica, 1900 m; valley of river Dečanska Bistrica, 1100 m; valley Ropojana, 1200 m; Karanfil, 1450 m, 2000 m; Belić, 1650 m, 2300 m; Žljeb, 1700 m.

Homalothecium sericeum (Hedw.) B., S. & G.: *merid-temp* – Planinica, 1900 m; springs Alipašini izvori near Gusinje, 1000 m; Djeravica, 2000 m; valley Ropojana, 1200 m; Devojački krš, 2000 m; near Peč (Szepesfalvy 1926 – 3387, DN42); Dečani near Peć (Szepesfalvy 1926 – 3487, DN41); pass Čakor (Szepesfalvy 1926).

Hygroamblystegium tenax (Hedw.) Jenn.: *temp* – gorge Rugovska klisura near Peć, 500 m.

****Hygrohypnum duriusculum*** (De Not.) Jamieson: *subarkt-subalp* – Starac, 2100 m; at lake Ridsko jezero, 2000 m.

Hygrohypnum luridum (Hedw.) Jenn.: *bor-temp* – Babina gora, 1600 m; gorge Rugovska klisura near Peć, 500 m.

Hylocomium splendens (Hedw.) B., S. & G.: *subbor* – valley of river Bogska reka, 1300 m; Babina gora, 1600 m; Planinica, 2000 m; Starac, 2100 m; valley Grbaja, 1200 m; Vragonos above river Treskavička reka, 1500 m; Treskavica under V. Rid, 1700 m; Djeravica, 2000 m; Pasji vrh, 2000 m; Maja Kurvala, 1800 m; valley Ropojana, 1200 m; Belić, 1800 m.

Hypnum callichroum Brid.: *subarkt-subalp* – Starac, 2100 m.

Hypnum cupressiforme Hedw.: *ubikv* – at spring of river Istočka reka near Peć, 600 m; valley of river Bogska reka, 1300 m; Hajla: Dramodol, 2100 m; Vizitor, 1400 m; Babina gora, 1600 m; Vragonos above river Treskavička reka, 1500 m; Treskavica under V. Rid, 1700 m; Belić, 2000 m; pass Čakor, 1500 m (Szepesfalvy 1926).

Hypnum jutlandicum Holmen & Warncke: *temp-subatl* – at spring of river Istočka reka near Peć, 600 m; near Peć (Szepesfalvy 1926 – 3387, DN42).

Hypnum pallescens (Hedw.) P. Beauv.: *temp-subkont* – Boge: at alpine house, 1700 m; Marjaš, 2100 m.

Hypnum recurvatum (Lindb. & H. Arnell) Kindb.: *subarkt-subalp* – Hajla: kota 2278; Malje Nedjinat, 1800 m; Volušnica, 1600 m.

Hypnum revolutum (Mitt.) Lindb.: *subarkt-subalp* – Žuti kamen, 1900 m; between Marjaš and Pasji vrh; Djeravica, 2400 m; Belić, 2300 m.

Hypnum vaucheri Lesq.: *bor.mont* – Hajla: kota 1933, 1900 m; Malje Nedjinat, 1800 m; Belić, 2300 m.

Isopterygiopsis pulchella (Schimp.) Iwats.: *bor-mont* – Babina gora, 1600 m; Starac, 1900 m; Planinica, 1900 m; Volušnica, 1600 m; Djeravica, 2000 m; Treskavica under V. Rid, 1800 m.

Isothecium alopecuroides (Dubois) Isov.: *bor-temp* – Babina gora, 1600 m; Vizitor, 1900 m; Starac, 1900 m; Volušnica, 1600 m; Trojan, 1900 m; Vragonos above river Treskavička reka, 1500 m; at lake Ridsko jezero, 2000 m; along river Ločanska Bistrica, 1300 m; valley Ropojana, 1200 m; Belić, 1800 m; near Peć (Szepesfalvy 1926 – 3387, DN42).

Isothecium myosuroides Brid.: *bor-temp* – valley of river Treskavička reka, 1400 m.

Kiaeria falcata (Hedw.) I. Hagen: *arkt-alp* – at lake Ridsko jezero, 2000 m.

Leptodon smithii (Hedw.) Web. & Mohr: *atl-medit* – at spring of river Istočka reka near Peć, 600 m.

Lescuraea mutabilis (Brid.) Lindb. ex I. Hagen: *temp-subkont* – Starac, 1900 m; Djeravica, 2000 m; Treskavica under Veliki Rid, 1700 m.

****Lescuraea saxicola*** (B., S. & G.) Milde: *bor-mont* – Starac, 2100 m; Karanfil, 1600 m.

Leskea polycarpa Hedw.: *temp* – valley of river Treskavička reka, 1400 m.

Leucodon sciuroides (Hedw.) Schwaegr.: *subtemp* – at spring of river Istočka reka near Peć, 600 m; valley of river Bogska reka, 1300 m; Vizitor, 1700 m; Babina gora, 1600 m; Marjaš, 1700 m; valley Grbaja, 1200 m; Volušnica, 1600 m; Vragonos above river Treskavička reka, 1500 m; Treskavica under Veliki Rid, 1900 m; Belić, 1650 m.

var. ***morensis*** (Schwaegr.) De Not.: *subatl-submed* – at spring of river Istočka reka near Peć, 600 m; valley of river Treskavička reka, 1400 m.

Metaneckera menziesii (Hook.) Steere: *submed* – valley of river Bogska reka, 1300 m; Starac, 1800 m; valley Grbaja, 1200 m; valley Ropojana, 1200 m; Belić, 1650 m.

Mnium ambiguum H. Müll.: *bor-mont* – Babina gora, 1600 m; Starac, 2100 m; valley Grbaja, 1200 m.

Mnium marginatum (Dicks.) P. Beuv.: *bor-temp* – Hajla: Škreli above Boge, 1800 m; Vizitor, 1500 m; Djeravica, 2000 m; valley Ropojana, 1200 m; Belić, 1900 m.

Mnium spinosum (Voit.) Schwaegr.: *bor-mont* – Hajla: Dramodol, 2100 m; Malje Nedjinat, 2200 m; Marjaš, 2300 m.

Mnium stellare Hedw.: *bor-temp* – Planinica, 1900 m; Marjaš, 2300 m; Malje Nedjinat, 1900 m; valley Grbaja, 1200 m; Pasji vrh, 1800 m; valley of river Dečanska Bistrica, 1200 m; Maja Kurvala, 1800 m; Karanfil, 2000 m; Hajla: kota 2278; Belić, 2300 m.

Mnium thomsonii Schimp.: *bor-mont* – Vizitor, 1900 m; Babina gora, 1600 m; Planinica, 2000 m; Starac, 2300 m; Malje Nedjinat, 1900 m; Popadija, 1800 m; Volušnica, 1600 m; Trojan, 1900 m; Belić, 2300 m; Žljeb, 1700 m.

Myurella julaceae (Schwaegr.) B., S. & G.: *subarkt-subalp* – Devojački krš, 1900 m; Pasji vrh 2100 m.

Neckera complanata (Hedw.) Hüb.: *bor-temp* – valley of river Bogska reka, 1300 m; Devojački krš, 1900 m; valley of river Dečanska Bistrica, 1100 m; valley Ropojana, 1200 m.

Neckera crispa Hedw.: *temp* – gorge Rugovska klisura near Peć, 500 m; near Peć (SZEPESFALVY 1926 – 3387, DN42); Crveni krš, 900 m (3288, DN53).

Oncophorus virens (Hedw.) Brid.: *subarkt-subalp* – Starac, 2100 m; Pasji vrh, 2400 m; at lake Ridsko jezero, 2000 m.

****Orthothecium intricatum*** (Hartm.) B., S. & G.: *bor-mont* – Starac, 2100 m; Karanfil, 1450 m; Belić, 2000 m.

Orthothecium rufescens (Brid.) B., S. & G.: *bor-mont* – gorge Rugovska klisura near Peć, 500 m.

Orthotrichum affine Brid.: *temp* – Babina gora, 1600 m.

Orthotrichum alpestre Hornsch. ex B., S. & G.: *subarkt-subalp* – Vizitor, 1500 m, on *Fagus* moesiaca.

Orthotrichum anomalum Hedw.: *subtemp* – Vizitor, 1500 m; pass Čakor, 1500 m (SZEPESFALVY 1926)

Orthotrichum cupulatum Brid.: *temp* – Starac, 1900 m; Malje Nedjinat, 1800 m; valley Ropojana, 1200 m; Vragonos above river Treskavička reka, 1500 m; Vizitor, 1500 m.

Orthotrichum diaphanum Brid.: *merid-temp.* - Peklen (SZEPESFALVY 1926 – 3387, DN42).

Orthotrichum rupestre Schleich. ex Schwaegr.: *bor-temp* – Starac, 2100 m.

Orthotrichum stramineum Hornsch. ex Brid.: *temp* – Vizitor, 1500 m, on *Fagus moesiaca.*

Palustriella commutata (Hedw.) Ochyra

var. ***commutata***: *bor-temp* – Vaganica, 2000 m; Vizitor, 1900 m; Devojački krš, 1900 m; Starac, 2100 m; Malje Nedjinat, 1800 m, 1000 m; at lake Ridsko jezero, 2000 m; valley of river Dečanska Bistrica, 1100 m; Maja Kurvala, 1800 m.

var. ***falcata*** (Brid.) Ochyra: *bor-temp* – Popadija, 1700 m.

*var. ***fluctuans*** (Bruch & al.) Ochyra: *bor-temp* – gorge Rugovska klisura near Peć, 500 m; springs Alipašini izvori near Gusinje, 1000 m.

Palustriella decipiens (De Not.) Ochyra: *subarkt-subalp* – Vaganica, 2000 m; Hajla: Dramodol, 2100 m; Vizitor, 1800 m; Starac, 2100 m; Malje Nedjinat, 1800 m; springs Alipašini izvori near Gusinje, 1000 m; Popadija, 1700 m; Trojan, 1900 m; Pasji vrh, 2200 m; Belić, 1900 m; Babino brdo, 1600 m,

Paraleucobryum enerve (Thed.) Loeske: *arkt-alp* – Starac, 2300 m; Djeravica, 2200 m; Babina gora, 1600 m.

Paraleucobryum sauteri (B., S. & G.) Loeske: *temp-subkont* – Karanfil, 1450 m.

Philonotis caespitosa Jur.: *bor-temp* – Vizitor, 1900 m; Djeravica, 2400 m.

Philonotis calcarea (B. & S.) Schimp.: *bor-temp* – Vizitor, 1900 m; valley of river Bogska reka, 1300 m; Malje Nedjinat, 1800 m; gorge Rugovska klisura near Peć, 500 m; springs Alipašini izvori near Gusinje, 1000 m; Popadija, 1700 m; valley of river Dečanska Bistrica, 1100 m.

Philonotis fontana (Hedw.) Brid.: *bor-temp* – Vaganica, 2000 m; Babina gora, 1600 m; Devojački krš, 1900 m; Starac, 2100 m; Malje Nedjinat, 1800 m; Djeravica, 2300 m; Pasji vrh, 2200 m; valley of river Treskavička reka, 1400 m; Maja Kurvala, 1900 m.

Philonotis marchica (Hedw.) Brid.: *merid-temp* – Treskavica under Veliki Rid, 1600 m; gorge Rugovska klisura near Peć, 500 m; Peklen (Szepesfalvy 1926 – 3387, DN42).

Philonotis seriata Mitt.: *subarkt-subalp* – Vizitor, 1900 m; Starac, 2100 m; Maja Kurvala, 1800 m; Štedin (RUDSKI 1936 – 3287, DN33).

****Philonotis tomentella*** Mol.: *ark-alp* – Devojački krš, 1900 m; Starac, 2100 m; Malje Nedjinat, 1700 m; Popadija, 1700 m; valley of river Treskavička reka, 1400 m; Djeravica, 2000 m; Treskavica under Veliki Rid, 1600 m; Karanfil, 1600 m; Belić, 1900 m.

Plagiobryum zierii (Hedw.) Lindb.: *subarkt-subalp* – Žljeb, 2000 m.

Plagiomnium affine (Bland.) T. Kop.: *temp* – Starac, 1900 m; Vragonos above river Treskavička reka, 1500 m; Treskavica under Veliki Rid, 1700 m; valley of river Ločanska Bistrica, 1300 m.

Plagiomnium cuspidatum (Hedw.) T. Kop.: *bor-temp* – Vizitor, 1500 m; springs Alipašini izvori near Gusinje, 1000 m; valley Grbaja, 1200 m; Vragonos above river Treskavička reka, 1500 m; valley Ropojana: near Savina voda, 1300 m; Karanfil, 1600 m.

Plagiomnium elatum (B. & S.) T. Kop.: *bor-temp* - Malje Nedjinat, 1700 m; Vragonos above river Treskavička reka, 1500 m.

Plagiomnium medium (B. & S.) T. Kop.: *bor-mont* – Planinica, 2000 m; Babina gora, 1600 m; valley Grbaja, 1200 m.

Plagiomnium rostratum (Schrad.) T. Kop.: *bor-temp* – Vaganica, 2000 m; valley of river Bogska reka, 1300 m; Malje Nedjinat, 1800 m; gorge Rugovska klisura near Peć, 500 m; Trojan, 1900 m;

valley Grbaja, 1200 m; valley Ropojana, 1200 m; Karanfil, 1450 m; Belić, 1400 m, 1800 m; Žljeb, 1700 m.

Plagiomnium undulatum (Hedw.) T. Kop.: *temp* – valley of river Bogska reka, 1300 m; springs Alipašini izvori near Gusinje, 1000 m; valley Ropojana, 1200 m.

Plagiopus oederiana (Sw.) Crum & Anders.: *bor-mont* – Vizitor, 1900 m; valley of river Bogska reka near Kučište, 1100 m; gorge Rugovska klisura near Peć, 500 m; valley of river Treskavička reka, 1400 m; Maja Kurvala, 1800 m; Belić, 1400 m, 1900; near Peć (Szepesfalvy 1926 – 3387, DN42).

var. ***alpina*** (Schwaerg.) Möller – Marjaš, 2000 m.

Plagiothecium cavifolium (Brid.) Iwats.: *bor-mont* – Vizitor, 1750 m; Babina gora, 1600 m.

Plagiothecium curvifolium Schlieph. ex Limpr.: *temp* – Žljeb, 1500 m.

Plagiothecium denticulatum (Hedw.) B., S. & G.: *bor-temp* – Vizitor, 1900 m; Babina gora, 1600 m; Planinica, 1900 m; Starac, 2100 m; Treskavica under V. Rid, 1800 m; Djeravica, 1800 m.

*var. ***obtusifolium*** (Turn.) Moore – Planinica, 1900 m; at lake Ridsko jezero, 2000 m.

Plagiothecium laetum B., S. & G.: *bor-mont* – Babina gora, 1600 m; Planinica, 2000 m; Maja Kurvala, 1800 m; Žljeb, 1500 m.

Plagiothecium nemorale (Mitt.) Jaeg.: *temp* – Vizitor, 1500-1700 m.

Plagiothecium platyphyllum Mönkm.: *bor-mont* – Starac, 2100 m (rev. Pilous)

Plagiothecium ruthei Limpr.: *bor-temp* – Planinica, 1900 m.

****Platydictya jungermannioides*** (Brid.) Crum: *subarkt-subalp* – Vizitor, 1700 m.

Pleurozium schreberi (Brid.) Mitt.: *bor-temp* – Starac, 2100 m; Marjaš, 2100 m; valley of river Ločanska Bistrica, 1300 m.

Pogonatum aloides (Hedw.) P. Beauv.: *bor-temp* – Babina gora, 1600 m; pass Čakor, 1500 m (Szepesfalvy 1926).

Pogonatum urnigerum (Hedw.) P. Beauv.: *bor-mont* – Babina gora 1700 m; Devojački krš, 2000 m; Starac, 2100 m; Vragonos above river Treskavička reka, 1500 m; Maja Kurvala, 1800 m; Belić, 1600 m.

Pohlia cruda (Hedw.) Lindb.: *bor-temp* – Žljeb, 2000 m; Vizitor, 1800 m; Babina gora, 1600 m; Devojački krš, 1800 m; Planinica, 1900 m; Starac, 2300 m; between Marjaš and Pasji vrh, 2100 m; valley Grbaja, 1200 m; Popadija, 1800 m; Djeravica, 2100 m; valley of river Treskavička reka, 1400 m; Maja Kurvala, 1800 m; valley Ropojana, 1200 m; Karanfil, 2000 m; Belić, 1650 m.

Pohlia elongata Hedw. var. ***elongata***: *bor-mont* – Djeravica, 2500 m.

Pohlia nutans (Hedw.) Lindb.: *subbor* – Devojački krš, 1800 m; Starac, 2000 m; Pasji vrh, 1900 m; at lake Ridsko jezero, 2000 m.

Polytrichum alpinum Hedw.: *subarkt-subalp* – Vizitor, 1700 m; Babina gora, 1700 m; Devojački krš, 2000 m; Starac, 2100 m; Planinica, 1900 m; Marjaš, 2000 m; at lake Ridsko jezero, 2000 m; Djeravica, 2300 m; Maja Kurvala, 1800 m; Belić, 2000 m; Žljeb, 1700 m..

Polytrichum commune Hedw. var. ***commune***: *subbor* – Starac, 2100 m; at lake Ridsko jezero, 2000 m; Djeravica, 2200 m; Stubica, 1400 m (Rudski 1949 – 3287, DN43).

Polytrichum formosum Hedw.: *bor-temp* – Hajla, 2270 m; Vizitor, 1700 m; Babina gora, 1700 m; Planinica, 2000 m; Popadija, 1800 m; Vragonos above river Treskavička reka, 1500 m; Treskavica under Veliki Rid, 1900 m; valley of river Treskavička reka, 1400 m; Karanfil, 1600 m.

Polytrichum juniperinum Hedw.: *bor-temp* – Boge, 1700 m; Hajla: Dramodol, 2100 m; Hajla 2270 m; Vizitor, 1900 m; Babina gora, 1700 m; Malje Nedjinat, 2200 m; Starac, 2400 m; valley Grbaja, 1200 m; Popadija, 1900 m; Trojan, 2000 m; Karanfil 2000 m; Djeravica, 2500 m; Belić, 2200 m.

****Polytrichum longisetum*** Sw. ex Brid.: *bor-temp* – Vizitor, 1900 m.

Polytrichum piliferum Hedw.: *bor-temp* – Devojački krš, 2000 m; Starac, 2300 m; near Gusinje, 1000 m; Pasji vrh, 2400 m.

Pseudoleskea incurvata (Hedw.) Loeske: *bor-mont* – Hajla: kota 2278, 1900 m; Boge, 1700 m; valley of river Bogska reka, 1300 m; Vizitor, 1900 m; Devojački krš, 1900 m; Planinica, 2000 m; Žuti kamen, 1700 m; Marjaš, 2000 m; Volušnica, 1600 m; Popadija, 1800 m; Trojan, 1900 m; valley Grbaja, 1200 m; Djeravica, 2200 m; Treskavica under Veliki Rid, 1900 m; Pasji vrh, 2000 m; valley Ropojana: near Savina voda, 1200 m; Karanfil, 1450 m, 2000 m; Belić, 1650 m, 2000 m, 2300 m; Žljeb, 1700 m.

****Pseudoleskea patens*** (Lindb.) Kindb.: *bor-mont* – Hajla: Dramodol, 2100 m; Babina gora, 1600 m; Starac, 2000 m; at lake Ridsko jezero, 2000 m.

****Pseudoleskea radicosa*** (Mitt.) Macoun & Kindb. var. ***radicosa***: *subarkt-subalp* – Vizitor, 1700 m; Planinica, 1900 m; Starac, 1900 m; valley of river Treskavička reka, 1400 m; Pasji vrh, 2000 m;

valley Ropojana, 1200 m; Karanfil, 1600 m, 2000 m; Žljeb, 1500 m; Djeravica, 2000 m.

Pseudoleskea saviana (De Not.) Latz.: *southalp-balk* – Vizitor, 1750 m; Volušnica, 1600 m; valley of river Treskavička reka, 1400 m; Treskavica under Veliki Rid, 1800 m; Maja Kurvala, 1700 m; Karanfil, 1600 m; Belić, 1900 m.

Pseudoleskeella catenulata (Schrad.) Kindb.: *bor-mont* – Hajla: Dramodol, 2100 m; Vizitor, 1900 m; Žuti kamen, 1800 m; Trojan, 1900 m; valley Grbaja, 1200 m.

Pseudoleskeella nervosa (Brid.) Nyh.: *bor-mont* – valley of river Bogska reka, 1300 m; Boge, 1600 m; Vizitor, 1700 m; valley Ropojana: near Savina voda, 1200 m; valley of river Ločanska Bistrica, 1300 m; Belić, 2100 m; Volušnica, 1600 m.

Pterigynandrum filiforme Hedw.: *bor-mont* – valley of river Bogska reka near Kučište, 1100 m; Hajla: Dramodol, 2100 m; Vizitor, 1700 m; Babina gora, 1600 m; Malje Nedjinat, 1800 m; between Marjaš and Pasji vrh; Starac, 2100 m; valley Grbaja, 1200 m; Popadija, 1800 m; Volušnica, 1600 m; Vragonos above river Treskavička reka, 1500 m; Djeravica, 2100 m; valley of river Ločanska Bistrica, 1300 m; Maja Kurvala, 1800 m; valley Ropojana, 1200 m; Belić, 1650 m.

Pterygoneurum ovatum (Hedw.) Dix.: *merid-temp* – Planinica, 1900 m.

Ptychodium plicatum (Web. & Mohr) Schimp.: *subarkt-subalp* – Boge, 1700 m; Hajla: kota 2278; Žljeb, 2000 m; Planinica, 1900 m; valley Grbaja, 1200 m; Popadija, 1800 m; Karanfil, 1450 m, 2000 m; Belić, 1900 m, 2300 m.

Racomitrium aciculare (Hedw.) Brid.: *bor-temp* – Babina gora, 1700 m; Starac, 2100 m.

Racomitrium canescens (Hedw.) Brid.: *bor-mont* – Treskavica under Veliki Rid, 1700 m; Popadija, 1800 m; Trojan, 1900 m; Karanfil, 1600 m; Belić, 1650 m.

Racomitrium elongatum Frisvoll: *bor-temp* – Žljeb, 1500 m; Treskavica under Veliki Rid, 1700 m; Trojan, 2000 m.

Racomitrium ericoides (Brid.) Brid.: *subbor* – Trojan, 2000 m; Belić, 1650 m.

****Racomitrium heterostichum*** (Hedw.) Brid.: *bor-temp* – Hajla: Dramodol, 2100 m; Vizitor, 1900 m; Devojački krš, 1900 m; Starac, 2100 m; Marjaš, 2400 m; Popadija, 1800 m; Treskavica under Veliki Rid, 1900 m; Djeravica, 2500 m; at lake Ridsko jezero, 2000 m; Maja Kurvala, 1800 m.

****Racomitrium sudeticum*** (Funck) B. & S.: *subarkt-subalp* – Vizitor, 1750 m; Starac, 2300 m; Djeravica, 2400 m; at lake Ridsko jezero, 2000 m.

Rhabdoweisia fugax (Hedw.) B., S. & G.: *bor-mont* – Starac, 2300 m.

Rhizomnium pseudopunctatum (B. & S.) T. Kop.: *bor-mont* – Starac, 2100 m; Djeravica, 2400 m.

Rhizomnium punctatum (Hedw.) T. Kop.: *bor-temp* – Vaganica, 1900 m; Vizitor, 1900 m; Babina gora, 1600 m; Starac, 2100 m; Malje Nedjinat, 1800 m; Popadija, 1700 m; Vragonos above river Treskavička reka, 1500 m; valley of river Treskavička reka, 1400 m; Treskavica above Veliki Rid, 1700 m; Pasji vrh, 2000 m; pass Čakor, 1500 m (SZEPESFALVY 1926).

****Rhodobryum roseum*** (Hedw.) Limpr.: *bor-temp* – Vizitor, 1900 m; Planinica, 2000 m.

Rhynchostegiella tenella (Dicks.) Limpr. var. ***tenella***: *subatl-submed* – Starac, 1800 m; valley Grbaja, 1200 m; Belić, 1700 m.

Rhynchostegiella tenuicaulis (Spruce) Kartt.: *temp* – Babina gora, 1600 m.

Rhynchostegium murale (Hedw.) B., S. & G.: *temp* – valley Ropojana, 1200 m; Karanfil, 2000 m.

Rhynchostegium riparioides (Hedw.) Card.: *temp* – gorge Rugovska klisura near Peć, 500 m; springs Alipašini izvori near Gusinje, 1000 m; valley Ropojana: Savina voda, 1200 m.

Rhytidiadelphus loreus (Hedw.) Warnst.: *bor-temp* – Starac, 1900 m; at lake Ridsko jezero, 2000 m.

Rhytidiadelphus squarrosus (Hedw.) Warnst.: *bor-temp* – Vragonos above river Treskavička reka, 1500 m; Belić, 1800 m.

Rhytidiadelphus triquetrus (Hedw.) Warnst.: *bor-temp* – Boge, 1700 m; Hajla: Škreli above Boge, 1800 m; Vizitor, 1900 m; Babina gora, 1600 m; Starac, 2000 m; valley Grbaja, 1200 m; Vragonos above river Treskavička reka, 1500 m; Popadija, 1800 m; valley Ropojana, 1200 m; Karanfil, 1600 m; Belić, 2300 m.

Rhytidium rugosum (Hedw.) Kindb.: *bor-temp* – valley of river Bogska reka, 1300 m; Marjaš, 1800 m; Djeravica, 1900 m.

Saelania glaucescens (Hedw.) Broth.: *subarkt-subalp* – Popadija, 1800 m; Pasji vrh, 3200 m;

Sanionia uncinata (Hedw.) Loeske: *bor-mont* – Vizitor, 1750 m; Devojački krš, 1900 m; Starac, 2100 m; Babina gora, 1600 m; Malje Nedjinat, 1700 m; Volušnica, 1600 m; valley of river Treskavička reka, 1400 m; Djeravica, 1900 m; valley Ropojana, 1200 m; Maja Kurvala, 1700 m; Belić, 1900 m; Žljeb, 1500 m; Maja Rusolija, 1900–2200 m (Rudski 1949 – 3287, DN43).

Schistidium apocarpum (Hedw.) B. & S.: *bor-temp* – at spring of river Istočka reka near Peć, 600 m; Boge, 1600 m; Hajla: kota 1933, 1900 m;

Vizitor, 1100 m, 1700 m; Planinica, 1900 m; Devojački krš, 2000 m; Starac, 2000 m; Malje Nedjinat, 1800 m; gorge Rugovska klisura near Peć, 500 m; springs Alipašini izvori near Gusinje, 1000 m; valley Grbaja, 1200 m; along river Ločanska Bistrica, 1200 m; valley Ropojana, 1200 m; Belić, 1650 m, 2300 m; pass Čakor, 1500 m (Szepesfalvy 1926).

var. ***homodictyon*** (Dix.) Crundw. & Nyholm – Hajla: kota 2278.

Schistidium atrofuscum (Schimp.) Limpr.: *bor-mont* – Marjaš, 2200 m; Malje Nedjinat, 2200 m; Belić, 1700 m.

Schistidium brunnescens Limpr.: *temp* – Hajla: kota 2278; Planinica, 1900 m.

Schistidium rivulare (Brid.) Podp. subsp. ***rivulare***: *bor-mont* - Babina gora, 1600 m.

Scleropodium purum (Hedw.) Limpr.: *temp* – Dečani near Peć (Szepesfalvy 1926 – 3487, DN41); near Peć (Szepesfalvy 1926 – 3387, DN42).

****Scorpidium cossonii*** (Schimp.) Hedenäs: *bor-mont* – Vizitor, 1750 m; Starac, 2200 m.

Seligeria pusilla (Hedw.) B., S. & G.: *bor-temp* – gorge Rugovska klisura near Peć, 500 m.

****Sphagnum capillifolium*** (Ehrh.) Hedw.: *bor-temp* - at lake Ridsko jezero, 2000 m; Starac, 2100 m.

****Sphagnum cuspidatum*** Ehrh. ex Hoffm.: *bor-temp* – at lake Ridsko jezero, 2000 m; Starac, 2100 m.

****Sphagnum denticulatum*** Brid.: *bor-temp* – Vizitor, 1750 m; Starac 2100 m.

****Sphagnum fallax*** (Klinggr.) Klinggr.: *bor-temp* – at lake Ridsko jezero, 2000 m; Starac 2100 m; Vizitor, 1750 m.

****Sphagnum girgensohnii*** Russ.: *bor-mont* – at lake Ridsko jezero, 2000 m.

****Sphagnum magellanicum*** Brid.: *bor-mont* – Vizitor, 1750 m.

****Sphagnum palustre*** L.: *bor-temp* – Vizitor, 1750 m.

****Sphagnum platyphyllum*** (Lindb. ex Braithw.) Sull. ex Warnst.: *bor-mont* – Starac, 2100 m.

****Sphagnum teres*** (Schimp.) Aongstr.: *bor-mont* – at lake Ridsko jezero, 2000 m; Starac, 2100 m

Syntrichia intermedia Brid.: *merid-temp* – at spring of river Istočka reka near Peć, 600 m; Malje Nedjinat, 1600 m.

Syntrichia norvegica Web.: *subarkt-subalp* – Boge, 1600 m; Hajla: kota 2278; Vizitor, 1900 m; Malje Nedjinat, 1900 m; Volušnica, 1600 m; Treskavica under Veliki Rid, 1600 m; Karanfil, 1600 m, 2000 m.

Syntrichia ruralis (Hedw.) Web. & Mohr subsp. ***ruralis***: *bor-temp* – Hajla: Dramodol, 2100 m; Hajla: Škreli above Boge, 1800 m; valley of river Bogska reka, 1300 m; Vizitor, 1700 m; Babina gora, 1600 m; Planinica, 2000 m; Starac, 2100 m; Malje Nedjinat, 1600 m; valley Grbaja, 1200 m; Volušnica 1600 m; Popadija, 1900 m; Trojan, 1900 m; springs Alipašini izvori near Gusinje, 1000 m; Vragonos above Treskavička reka, 1500 m; along river Ločanska Bistrica, 1300 m; Maja Kurvala, 1900 m; valley Ropojana, 1200 m; Karanfil, 1450 m, 2000 m; Belić, 1650 m, 2200 m; pass Čakor, 1500 m (Szepesfalvy 1926).

Tayloria froelichiana (Hedw.) Mitt. ex Broth.: *subarkt-subalp* – Malje Nedjinat, 1900 m.

Tetraphis pellucida Hedw.: *bor-temp* – Babina gora, 1700 m.

Thamnobryum alopecurum (Hedw.) Gang. var. ***alopecurum***: *temp* – Vragonos above river Treskavička reka, 1500 m.

Thuidium abietinum (Hedw.) B., S. & G.: *ubikv* – valley of river Bogska reka, 1300 m; Hajla: Dramodol, 2100 m; Vizitor, 1500 m; Devojački krš, 1900 m; valley Grbaja, 1200 m; Belić, 1700 m; Peklen (Szepesfalvy 1926 – 3387, DN42).

Thuidium delicatulum (Hedw.) Mitt.: *temp* – near Peć (Szepesfalvy 1926 – 3387, DN42); Dečani near Peć (Szepesfalvy 1926 – 3487, DN41).

Thuidium philiberti Limpr.: *temp* – gorge Rugovska klisura near Peć, 500 m; valley Grbaja, 1200 m; valley Ropojana, 1200 m; Belić, 1400 m.

*var. ***pseudotamarisci*** (Limpr.) Mönkm. – Karanfil, 1450 m; valley Ropojana, 1200 m; Belić, 1650 m.

Thuidium tamariscinum (Hedw.) B., S. & G.: *temp* – Dečani near Peć (Szepesfalvy 1926 – 3487, DN41); Maja Rusolija, 1900–2200 m (Rudski 1949 – 3287, DN43).

****Timmia austriaca*** Hedw.: *subarkt-subalp* – Boge, 1700 m; Vizitor, 1900 m; Planinica, 2000 m; Devojački krš, 1900 m; Starac, 2100 m; Malje Nedjinat, 1900 m; Popadija, 1800 m; Pasji vrh, 2000 m; Djeravica, 2300 m; Maja Kurvala, 1900 m; Karanfil, 1450, 2000 m; Belić, 1650, 2300 m.

Timmia bavarica Hessl.: *subarkt-subalp* – Vizitor, 1900 m; Devojački krš, 2000 m; Starac, 2200 m; Karanfil, 2100 m; Belić, 1900 m; Žljeb, 1500 m.

Timmia norvegica Zetterst.: *subarkt-subalp* – Boge, 1700 m; Hajla: kota 2278; valley Ropojana, 1200 m; Belić, 1900 m.

Tortella inclinata (Hedw. f.) Limpr.: *temp* – Belić, 1650 m.

Tortella tortuosa (Hedw.) Limpr.: *bor-temp* – at spring of river Istočka reka near Peć, 600 m; Boge, 1500 m; Hajla: Dramodol, 2100 m; Vizitor, 1900 m; Žuti Kamen, 2000 m; Planinica, 1900 m;

Starac, 2100 m; Malje Nedjinat, 1700 m; gorge Rugovska klisura near Peć, 500 m; valley Grbaja, 1200 m; Popadija, 1900 m; springs Alipašini izvori near Gusinje, 1000 m; valley Ropojana, 1200 m; Karanfil, 1600 m; Belić, 1800 m; Žljeb, 1700 m.

Tortula mucronifolia Schwaerg.: *bor-mont* – Malje Nedjinat, 1700 m; near Peć (SZEPESFALVY 1926 – 3387, DN42)

Tortula muralis Hedw.: *temp* – at spring of river Istočka reka near Peć, 600 m; Vizitor, 1500 m; along river Dečanska Bistrica, 900 m; valley Ropojana, 1200 m; pass Čakor, 1500 m (SZEPESFALVY 1926).

var. ***aestiva*** Hedw.: *temp.* – at spring of river Istočka reka near Peć, 600 m.

Tortula obtusifolia (Schwaegr.) Math.: *temp* – Starac, 1900 m; Popadija, 1800 m.

Tortula subulata Hedw.: *subtemp* – valley of river Bogska reka near Kučište, 1100 m; Hajla: Dramodol, 2100 m; Žljeb, 2000 m; Devojački krš, 2000 m; Starac, 2200 m; Babina gora, 1600 m; Malje Nedjinat, 2000 m; Popadija, 1900 m; Trojan, 1900 m; Volušnica, 1600 m; Djeravica, 2300 m; Treskavica under Veliki Rid, 1900 m; Maja Kurvala, 1800 m; along river Ločanska Bistrica, 1300 m; Karanfil, 2000 m; Belić, 2300 m; pass Čakor, 1500 m (SZEPESFALVY 1926).

*var. ***angustata*** (Schimp.) Lindb.: *merid-temp* – Treskavica under Veliki Rid, 1600 m.

var. ***graeffii*** Warnst. – valley of river Bogska reka, 1100 m; Starac, 1900 m; along river Dečanska Bistrica, 1100 m.

Trichostomum crispulum Bruch: *merid-temp* – gorge Rugovska klisura, 500 m; Volušnica, 1600 m; valley Ropojana, 1200 m.

Warnstorfia exannulata (B., S. & G.) Loeske: *bor-temp* – Starac, 2100 m; at lake Ridsko jezero, 2000 m.

Weisia condensa (Voit.) Lindb.: *merid-temp* – Popadija, 1700 m; Malje Nedjinat, 2300 m.

Weisia controversa Hedw.: *merid-temp* – Devojački krš, 1900 m; Popadija, 1900 m; valley Ropojana, 1200 m; Žljeb, 1700 m.

Chorological analysis

The basis for the classification of geoelements was the work of DÜLL (1999), but his classifications were modified in many respects when considering the work of HILL & PRESTON (1998) and the author's own findings (MARTINČIČ 1966). Unlike the conditions in vascular plants, the chorological analysis of the entire distribution area of mosses is extremely difficult and often even impossible. This is because the moss species' distribution areas often extend over more than one continent or even on both hemispheres and are extremely disjunctive. When discussing the European species it is therefore more appropriate to define the floral elements based only on the European or Eurasian distribution area. The most important starting point here are the zonal vegetation belts – arctic, boreal, temperate, meridional (comp. SZMAJDA 1989, MARTINČIČ 1966) – or zonobiomes (HILL & PRESTON 1998), with consideration of altitudinal belts. Changes in classifications as given by Düll occurred especially in assessment of the concepts of *oceanic* and *continental*, used by Düll to name geoelements, with which he thwarts the principle of zonal climatic vegetation belts.

The results of the chorological analysis are presented in Figure 2. Phytogeographically the most important group is the arctic-alpine geoelement (arctic-alpine, subarctic-subalpine). It comprises 35 species (13,1 %), the largest part of which are the subarctic-subalpine species, i.e. the species which do not reach into the real Arctic within Europe. Denotation »subalpine« is not the most suitable, as these species grow mostly in the alpine belt on the Balkan Peninsula – in the Prokletije Mts. and Macedonian mountains (comp. MARTINČIČ 1966). HORVAT (1953) already stressed that Prokletije Mts.,

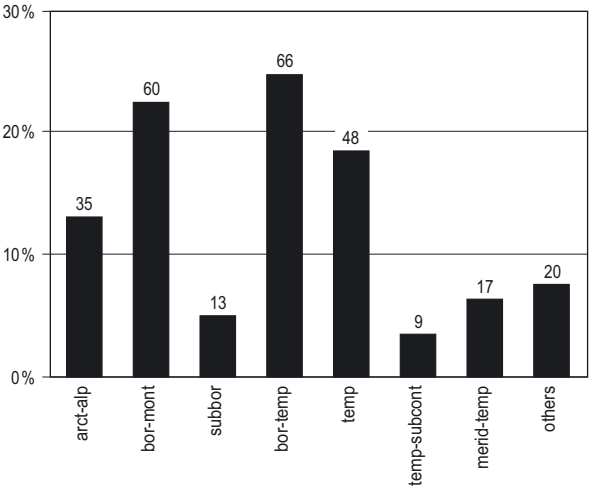

Figure 2: Distribution of mosses of the Prokletije Mts. over chorological elements (in %). Numbers above bars – number of species.

Slika 2: Razporeditev horoloških elementov v flori listnatih mahov Prokletij. Številke nad stolpci – število vrst.

apart from the Macedonian mountains, are an important diversity centre for flowering plants and lichens of the Alpine-arctic origin. The same is evident in moss flora. Contrary to the situation in the Macedonian mountains, however (Martinčič 1966, 1980), where most of the arctic-alpine moss species grow only on silicate bedrock, in the Prokletije Mts. grow on silicate, crystalloid slates, as well as on Triassic limestones. It can be said for the entire group of arctic-alpine species that it migrated into the Prokletije Mts. in the Pleistocene. The largest number of species migrated from the Alps towards the southeast across the Dinaric crests. Unfavourable climatic conditions today, however, prevent the growth of most of these elements in the region between the Alps and the Prokletije Mts. The only exception are the silicate mountains Vranica in Bosnia. This is the reason why many arctic (subarctic)-alpine(subalpine) species in the western parts of the Balkan Peninsula exhibit a characteristic disjunct distribution or part of it: the Alps (Slovenia) – Vranica (Bosnia) – Prokletije Mts. (Serbia, Montenegro) – Šar planina (Macedonia).

The boreal-montane element is represented with an even higher number of species as an arctic-alpine element. It comprises as many as 60 species (22,4 %). The vertical range of thriving is relatively large. Most often, the species thrive in the regions above the timberline, the upper altitudinal line is between 2200 and 2500 m. Only rarely and only isolated species reach below the 1000 m line. In comparison with the Alps there is therefore a perceptible increase in altitude for the lowest of the localities.

Considering also the subboreal species (13 – 4,8 %) we can determine that the flora of mosses in the Prokletije Mts. comprises as many as 40.3 % species which can be called the »northern element«. The diversity centre of these species in Europe is in Scandinavia and in the mountains of Central Europe. Although we can notice an explicit decrease in the number of these species toward the south, they give the Prokletije Mts., contrary to the situation in flowering plants, an explicitly Alpine (Central-European) character.

This picture is complemented by another 66 (24,6 %) species of the boreal-temperate element (sensu Hill & Preston 1998). The species growing in Europe, above all in the boreal and temperate zonobiome are considered a boreal-temperate element, which corresponds to the boreal and Central-Europen floral region (sensu Meusel). Also worth mentioning is the group of the temperate element: temperate, temperate subcontinental (= Central-European), subtemperate, which comprises altogether 57 species (21,3 %). Among them, there are 43 species (16 %) that are truly temperate. The temperate-subcontinental element is represented with 9 species (3.4 %) – the species whose distribution area in Europe does not reach into the Atlantic parts in the west. Some of them have a relatively clear Central-European distribution. Of other 37 species (7.5 %) we consider 17 (6.3 %) to belong to the meridional-temperate element (south-temperate sensu Hill & Preston 1998). All other species, with the exception of *Leptodon smithii* (atl-med), *Metaneckera menziesii* and *Rhynchostegiella tenella* (subatl-submed), *Leucodon sciuroides* var. *morensis* (submed), are the species commonly distributed in Europe.

Nature conservation value of the bryoflora

Prokletije is included in the Site Register of the briologically important parts of Europe on account of the considerable diversity of moss flora and chorological types of species (Martinčič 1995). Comparison with Sabovljević's calculations of the proportion of the number of species and the size of a particular region (Sabovljević (2004: 23) confirms that Prokletije is in fact one of the richest regions in the Balkan peninsula. Its significance is even greater considering that especially the higher regions are very well preserved. For the time being, human influence remains relatively small and for the most part limited to traditional management, pasture. Only in certain areas in the lower regions is the use of forests more significant. The impact of tourism is negligible as it was practically non-existent because of the region's borderline position between Albania and former Yugoslavia. For all these reasons, briophytic flora still has a completely natural character. And as the habitats are so well preserved there are no signs of reduction in the population size of individual species or of any real threat to them.

However, when taking into consideration the Red list for Serbia-Montenegro (Sabovljević et al. 2004) we ascertain that 46 species from the list of the moss flora of Prokletije are considered endangered. 11 of these species fall into the category of critically endangered species (CR), 17 into the category of endangered species and 18 into the category of vulnerable species. A further 20 species are

in the low risk category. Nevertheless, when dealing with such definitions we should be aware that the list is based on the revised IUCN criteria. These are founded above all on quantitative signs, on the number of the sites known in a certain area (see HALLINGBÄCK et al. 1998). In our case, this is seen especially in the critically endangered category and in the category of endangered species, where all of the 16 species found in Prokletije are included and which are new to Serbia-Montenegro. The inadequacy of quantitative criteria when determining the threat status in countries which have not been floristically adequately researched has already been stressed by PAPP & ERZBERGER (2005).

Nine species are included in the Red Data Book of European Bryophytes (ECCB 1995). Among them, one species, *Buxbaumia viridis* is vulnerable (VU), five species are in the rare (R) category: *Brachythecium geheebii, Bryum blindii, Dicranella humilis, Grimmia caespiticia, Paraleucobryum sauteri*; and three of them are regionally threatened (RT): *Campylium elodes, Pseudoleskea saviana, Tayloria froelichiana.*

POVZETEK

Mahovna flora Prokletij (Srbija, Črna Gora)

Ozemlje nekdanje Jugoslavije je v briofloristič nem pogledu zelo neenakomerno raziskano. Med najmanj raziskanimi predeli so nekatera gorstva v Črni gori, Makedoniji in Srbiji (Kosovo). Eno takih območij so Prokletije. Za del, ki leži na ozemlju držav Srbija, Črna gora, so bili doslej na razpolago le maloštevilni podatki o mahovni flori.

Preučevano območje

Prokletije so masiv, ki se razprostira v širšem obmejnem pasu med državami Srbija in Črna gora (republiki nekdanje Jugoslavije) ter Albanija (sl. 1). Predstavljajo jugovzhodni zaključek Dinarskega gorstva, ki se na jugu, v Albaniji, zaključuje z reko Drim. V nekdanjem jugoslovanskem delu se razprostirajo med Skadarskim jezerom in Vrmošo na zahodu ter Belim Drimom na vzhodu. Na severu se zaključijo s Hajlo, Žljebom in Mokro planino. Najvišji vrh je Djeravica (2656 m), večje število vrhov pa presega 2400 m. V geološkem pogledu vlada velika pestrost. Velik del »jugoslovanskih« Prokletij je zgrajen iz permokarbonskih skrilavcev ter paleozojskih skrilastih apnencev. Čeznje so ponekod debele plasti triadnih apnencev in dolomitov. Kisle eruptivne kamnine so močno lokalizirane. V pleistocenu so bile Prokletije izpostavljene zelo močnemu vplivu poledenitev. Led je pokrival ne samo vrhove, temveč je segal daleč navzdol, obstajali pa so tudi veliki dolinski ledeniki.

Nahajališča (razvidna so v angleškem besedilu) so opremljena s številko osnovnega polja sistema srednjeevropskega floristič nega kartiranja (MTB), ki smo ga uporabili za celotno ozemlje nekdanje Jugoslavije. Oznaka v oklepaju pa izhaja iz mreže UTM (34T del) in podrazdelitve na mrežo 10 × 10 km. Večina lokacij je opremljena tudi s kratico države, v kateri ležijo: Srbija (**S**) ali Črna gora (**M**).

Horološka analiza

Na podlagi dosedanjih podatkov obsega flora listnatih mahov (*Musci*) »jugoslovanskega« dela Prokletij 268 vrst, kar predstavlja 42 % od skupnega števila doslej v Srbiji in Črni gori ugotovljenih vrst iz te skupine. 10 vrst je novih za ozemlje Srbije in 44 za Črno goro.

Podlago za opredelitev geoelementov je sicer predstavljalo delo DŮLLA (1999), vendar smo njegove opredelitve v mnogočem modificirali na podlagi dela HILL & PRESTON (1998) ter lastnih dognanj (MARTINČIČ 1966). V nasprotju z razmerami pri semenkah je horološka opredelitev celotnega areala pri mahovih zelo težavna, marsikdaj celo nemogoča. Areali mahovnih vrst se namreč pogosto raztezajo na več kontinentih ali celo na obeh poloblah in so močno disjunktni. Zato je za vrste, ki uspevajo v Evropi, mnogo bolj smiselna opredelitev flornih elementov le na podlagi evropskega ali evrazijskega areala. Pri tem predstavljajo najpomembnejše izhodišče zonalno potekajoči vegetacijski pasovi – arktični, borealni, temperatni, meridionalni (prim. SZMAJDA 1989, MARTINČIČ 1966) oz. zonobiomi pri HILL & PRESTON (1998), z upoštevanjem višinskih pasov.

Rezultate horološke analize prikazuje slika 2. Fitogeografsko najpomembnejšo skupino predstavlja arktično-alpinski geoelement (arktično-alpinski, subarktično-subalpinski). Obsega 35 vrst (13,1 %), od tega odpade največji del na subarktično-subalpinske vrste, torej take, ki v Evropi ne segajo v pravo Arktiko. Že HORVAT (1953) poudarja, da so Prokletije, poleg makedonskih gorstev, pomemben center razširjenosti cvetnic in lišajev alpsko-arktičnega porekla. Omenjeno je razvidno tudi pri mahovni flori. Za celotno skupino lahko rečemo, da se je priselila v Prokletije v pleistocenu.

Še številneje je zastopan borealno-montanski element. Obsega kar 60 vrst (22,4 %). Najpogosteje uspevajo v predelih nad gozdno mejo, zgornja višinska meja je med 2200–2500 m. Le redko in izolirano sežejo pod 1000 m. V primerjavi z Alpami je viden občuten dvig nadmorske višine najnižjih nahajališč. Ob upoštevanju še subborealnih vrst (13–4,8 %) lahko ugotovimo, da je v flori listnatih mahov v Prokletijah kar 40,3 % vrst, ki jih lahko označimo kot »severni element«. V nasprotju z razmerami pri cvetnicah dajejo v Prokletijah izrazit alpski (srednjeevropski) pečat.

Navedeno podobo izpopolnjuje še 66 (24,6 %) vrst borealno-temperatnega elementa (sensu Hill & Preston 1998). Sem štejemo vrste, ki uspevajo v Evropi predvsem v borealnem in temperatnem conobiomu, kar ustreza borealni in srednjeevropski florni regiji (sensu Meusel). Omembe vredna je še skupina temperatni element: temperatni, temperatno-subkontinentalni (= srednjeevropski), subtemperatni, ki obsega skupno 57 vrst (21,3 %). Med preostalimi 37 (7,5 %) vrstami prištevamo 17 (6,3 %) vrst v meridionalno-temperatni element (south-temperate sensu Hill & Preston 1998). Vse druge so z izjemo vrst *Leptodon smithii* (atl-med), *Metaneckera menziesii* in *Rhynchostegiella tenella* (subatl-submed), *Leucodon sciuroides* var. *morensis* (submed) v Evropi splošno razširjene (ubikv).

Naravovarstvena ocena

Prokletije so vključene v Seznam biološko pomembnih območij Evrope (Martinčič 1995). Po vrstni pestrosti predstavljajo eno najbogatejših območij na Balkanu. Njihov pomen je še toliko večji, ker je vpliv človeka, zlasti v višjih legah, minimalen, ohranjeni so vsi pomembni habitati, zaradi obmejne lege pa tudi v bližnji prihodnosti ni pričakovati večjih škodljivih posegov zaradi komunikacije, urbanizacije, turizma. Ne glede na rečeno, pa na podlagi Rdečega seznama ogroženih mahov Srbije in Črne gore spada 46 vrst med ogrožene: 11 vrst je v kategoriji kritično ogrožene, 17 je ogroženih in 18 ranljivih. Nadaljnjih 20 vrst spada med neznatno ogrožene. Opredelitev je izvedena na podlagi novih kriterijev IUCN, ki upoštevajo za mahove v večini primerov zgolj število nahajališč (Hallingbäck et al. 1998) in ne ogroženosti njihovih habitatov. Pri floristično slabše raziskanih območjih je starejša klasifikacija mnogo bolj ustrezna.

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